INSTRUMENT TYPE IDENTIFICATION LETTERS

THIS TABLE APPLIES ONLY TO THE FUNCTIONAL IDENTIFICATION OF INSTRUMENTS

	FIRST LETTER		SUCCEEDING LETTERS		
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER FLAME		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
C	CONDUCTIVITY (ELECTRICAL)			CONTROL	CLOSE
D	DENSITY (MASS) OR SPECIFIC GRAVITY	DIFFERENTIAL OR DIGITAL			
E	VOLTAGE (EMF)				
F	FLOW RATE	RATIO (FRACTION)			FORWARD
G	GAGING (DIMENSIONAL)		GLASS		
H	HAND (MANUALLY INITIATED)				HIGH
I	CURRENT (ELECTRICAL)		INDICATE OR INPUT		
J	TIME				
K	POWER TIME SCHEDULE	SCAN		CONTROL STATION	
L	LEVEL		LIGHT (PILOT)		LOW
M	MOISTURE OR HUMIDITY				MIDDLE OR INTERMEDIATE
N	USER'S CHOICE		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
O	EVENT, STATE OR PRESENCE		ORIFICE (RESTRICTION)		OPEN
P	PRESSURE OR VACUUM		POINT (TEST CONNECTION)		
Q	QUANTITY	INTEGRATE OR TOTALIZE			
R	RADIOACTIVITY	RELIEF	RECORD OR PRINT		REVERSE
S	SPEED OR FREQUENCY	SAFETY		SWITCH OR SELECTOR	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION			VALVE, DAMPER OR LOUVER	
W	WEIGHT / FORCE		WELL		
X	UNCLASSIFIED		UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	USER'S CHOICE			RELAY OR COMPUTE	
Z	POSITION			DRIVE, ACTUATE OR UNCLASSIFIED FINAL CONTROL ELEMENT	

SYMBOLS

- INSTRUMENT TO PROCESS SIGNAL SOFTWARE LINK
- CAPILLARY TUBE
- PNEUMATIC
- HYDRAULIC
- GUIDED SONIC
- NEEDLE VALVE (NR)
- BALL VALVE (BV)
- BALL CHECK VALVE (BCV)
- SWING CHECK VALVE (SCV)
- CONE CHECK VALVE (CC V)
- BUTTERFLY VALVE, DAMPER (BFV)
- PLUG VALVE (PV)
- ECCENTRIC PLUG VALVE (EPV)
- GATE VALVE (GV)
- DIAPHRAGM VALVE (DPV)
- GLOBE VALVE (GLV)
- FLOAT VALVE (FV)
- 3-WAY MIX VALVE
- 3-WAY DIVERTER VALVE
- 3-WAY SOLENOID VALVE
- ANGLE VALVE
- SOLENOID VALVE (SV)
- SELF-OPERATING BACK PRESSURE REGULATOR VALVE (PRG)
- SELF-OPERATING PRESSURE REGULATOR VALVE (PRD)
- PRESSURE REDUCING REGULATOR VALVE W/EXTERNAL PRESSURE TAP (PRDV)
- FLUSHING LINE
- GEAR BOX
- SCREW CONVEYOR
- PINCH VALVE
- SLUICE GATE (SLUGAT)
- MOTORIZED SLIDE GATE
- WEIR GATE (WRGAT)
- TELESCOPIC VALVE (TV)
- PP BALL VALVE
- 3 WAY BALL VALVE
- DRUM SCREEN
  DRUM SCREEN MEDIUM (MS)
  DRUM SCREEN FINE (FS)
- ACCUMULATOR
- AERATOR
- CALIBRATION STANDPIPE
- CHEMICAL SEAL (CSL)
- IN LINE SEAL (ILS)
- CONCENTRIC REDUCER
- DRAIN (DRN)
- DUPLEX STRAINER
- ECCENTRIC REDUCER
- DISMANTLING JOINT
- FLEXIBLE HOSE
- GRINDER
- VERTICAL SHAFT MIXER (MXR)
- PRESSURE GAUGE
- AUTO SAMPLER
- ULTRASONIC LEVEL TRANSMITTER
- DECANTER
- KNIFE GATE VALVE
- RADIO, ULTRASONIC, OR ACOUSTIC SIGNAL
- RUPTURE DISC (PRESSURE RELIEF)
- SCRAPER
- STRAINER
- FLEXIBLE CONNECTOR
- SILENCER
- DISCHARGE SILENCER
- DIFFUSER OR GUIDE VANES
- PRESSURE SENSOR WITH DIAPHRAGM SEAL
- STATIC MIXER
- TANK VENT
- UNION
- CYLINDER ACTUATOR
- DIAPHRAGM ACTUATOR WITH POSITIONER
- HYDRAULIC OPERATOR
- DAMPENER
- MOTORIZED DAMPENER
- SLUICE GATE DRAIN (SLUGAT-D)
- PARSHALL FLUME (FM)
- LEAK DETECTORS
- MOTORIZED GATE VALVE (GV)
- VACUUM RELIEF VALVE (VRV)
- QUICK DISCONNECT
- MOTOR OPERATOR
- PNEUMATIC OPERATOR
- SOLENOID OPERATOR
- TERMINAL STRIP IN LOCAL PANEL FOR INTERFACE WITH COMPUTER/MUX
- FLOW ELEMENT GENERAL (FE) (DEFINED IN SPECIFICATIONS)
- VORTEX METER (FM)
- MAGNETIC FLOWMETER (FM)
- THERMAL MASS FLOW METER
- DOSING RING
- ROTAMETER (FM)
- ACOUSTIC OR DOPPLER INLINE FLOWMETER
- AXIAL FLOW PUMP
- CENTRIFUGAL BLOWER (BWR)
- CENTRIFUGAL PUMP (PMP)
- SUBMERSIBLE CENTRIFUGAL PUMP (PMP)
- SCREW PUMP
- ULTRASONIC FLOW METER
- FLOW SWITCH
- HOIST
- PRESSURE RELIEF VALVE (PRV)
- PULSATION DAMPENER (PD)
- WEIR
- DIAPHRAGM PUMP (PMP)
- HOSE PUMP (PMP)
- METERING PUMP (PMP)
- MOTORIZED KNIFE GATE VALVE
- PROGRESSIVE CAVITY PUMP (PMP)
- ROTARY LOBE PUMP (PMP)
- SUBMERSIBLE MIXER (MXR)
- FILTER/SILENCER (FLT / SLN)
- DIFFUSER
- HORN (HRN)
- SURGE VESSEL (SGV)
- SCUM COLLECTOR
- COARSE SCREEN
- TRASH SCREEN
- MOTOR OPERATOR VSD
- CALIBRATION POT

PROCESS STREAM CODES

ABINF = Aeration Basin Influent
AEF = Aeration Effluent
AL = Alum
CL = Chlorine Gas
CTA = Citric Acid
DFLT = Dewatering Filtrate
DGE = Digester Effluent
DGI = Digester Influent
DSUP = Sludge Tank Supernatant
DWSL = Dewatered Sludge
ETF = equalization effluent
FOG = Fats, Oil, Grease
G = Biogas
GBA = Grit Basin Air
GRS = Grit Slurry
INF = Plant Influent
MG = Methane Gas
ML = Mixed Liquor
MLR = Mixed Liquor Internal Recycle
PAA = Process Aeration Air
SBM = Sludge Blanket Monitor

PEF = primary effluent
PER = MBR Permeate
PLW = Plant Water
PRD = Process Drain
PREF = Preliminary Effluent
PSL = Primary Sludge
PSM= Primary Scum Matter
PSR = Primary Sludge Recirculation
RAS = Return Activated Sludge
RCY = Recycle
SD = Storm Water Drain
SEF = Secondary/SBR Effluent
SHC = Sodium Hypochlorite
SSM=Secondary Scum Matter
SWR = Service Water
TEF = Treated Effluent
TFLT = Thickening Filtrate
TSL = Thickened Sludge
VTA = Ventilation Air
WAS = Waste Activated Sludge
NP = Neutralization Pit

HAND SWITCH POSITION SYMBOLS

(UNLABELLED SWITCHES ARE TO BE ON-OFF)

A	AUTO
C	CLOSE
H	HAND
J	JOG
L	LOCAL
M	MANUAL
O	OPEN OR OFF
R	REMOTE
S/S	START / STOP
E/S	EMERGENCY STOP
DTY	DUTY
SBY	STANDBY
FOR	FORWARD - OFF - REVERSE (SPRING RETURN TO OFF)
L/R	LOCAL / REMOTE
LOR	LOCAL - OFF - REMOTE
HOR	HAND-OFF-REMOTE
OSC	OPEN - STOP - CLOSE
MOA	MANUAL - OFF - AUTO
USD	UPWARD - STOP - DOWNWARD

MISCELLANEOUS ABBREVATIONS

Σ	ADD OR TOTALIZE	Δ	DIFFERENCE	FC	FULLY CLOSE
√	SQUARE ROOT	I/O	INPUT / OUTPUT	FO	FULLY OPEN
X	MULTIPLY	ER	ELECTRICAL ROOM	HH	HIGH - HIGH
o/o	DIVIDE	LEL	LOWER EXPLOSIVE LIMIT	LL	LOW - LOW
MV	MEASURED VARIABLE	DW	DEWATERING	H	HIGH
SP	SET POINT	OC	ODOUR CONTROL	L	LOW
PLC	PROGRAMMABLE LOGIC CONTROLLER	OCF	ODOUR CONTROL FAN	AS	AIR SUPPLY
f(x)	CHARACTERISTIC / UNSPECIFIED FUNCTION	WW	WASTE WATER	LCP	LOCAL CONTROL PANEL
f(t)	TIME FUNCTION	D	DRAIN	OF	OVERFLOW
P	PROPORTIONAL CONTROL MODE	OTC	OPEN-TRAVEL-CLOSE	STPC	STEP CONTROL
∫	INTEGRAL CONTROL MODE	VFD	VARIABLE FREQUENCY DRIVE	SS	SOFT SWITCH, SOFT STARTER
D	DERIVATIVED CONTROL MODE	FACP	FIRE ALARM CONTROL PANEL	SWR	SERVICE WATER
BPS	BOOSTER PUMP STATION	ATS	AUTOMATIC TRANSFER SWITCH		
		VSD	VARIABLE SPEED DRIVE		

INSTRUMENT SYMBOLS

- FRONT PANEL MOUNTED
- REAR PANEL MOUNTED
- FIELD MOUNTED
- STATUS INDICATION
- 120 VAC POWER SUPPLY
- INTERLOCK LOGIC
- MS — MOTOR STARTER
- 24 / 25 — SPECIFIC LOOP NUMBER; DUPLICATE LOOP IDENTIFICATION SYMBOL; REFERENCE LOOP NUMBER
- COMPUTER CONTROL SYSTEM CONFIGURABLE FUNCTION (DISPLAYED ON HMI)
- COMPUTER CONTROL SYSTEM CONFIGURABLE FUNCTION (NOT DISPLAYED ON HMI)
- OR — SOFTWARE LOGIC
- TD — CONFIGURABLE FUNCTION (NOT DISPLAYED ON CRT)
- PA — PRESSURE ALARM INDICATION ON HMI
- XI — MOTORIZED VALVE INDICATION ON HMI
- PIT — PRESSURE INDICATING TRANSMITTER
- FIT — FLOW INDICATING TRANSMITTER
- LIT — LEVEL INDICATING TRANSMITTER
- AIT — ANALYZER INDICATING TRANSMITTER

FUNCTIONAL IDENTIFICATION (SEE LEGEND TABLE)

HS 24 — ON/OFF ← MODIFIER; (CP) XXX ← INSTRUMENT LOCATION; SUPPLIER; LOOP NUMBER

AA:101 / AB:101 — FACILITY PREFIX; SPECIFIC LOOP NUMBER; DUPLICATE LOOP IDENTIFICATION SYMBOL; REFERENCE LOOP NUMBER; REFERENCE FACILITY

AA:120 / 121 — FACILITY PREFIX; SPECIFIC LOOP NUMBER; DUPLICATE LOOP IDENTIFICATION SYMBOL; REFERENCE LOOP NUMBER; REFERENCE FACILITY IS THE SAME AS THE FACILITY PREFIX

REV.	DATE OF ISSUE	PREPARED BY	CHECKED BY	VALIDATED BY	PM	TENDER PURPOSE

CLIENT: BANGALORE WATER SUPPLY AND SEWERAGE BOARD

CONSULTANT: NJS ENGINEERS INDIA PVT. LTD

PROJECT: UPGRADATION OF 40 MLD RAJACANAL PHASE I PROJECT

TITLE: PIPING AND INSTRUMENTATION DIAGRAM (P&ID) LEGEND SHEET

(SHEET-1 OF 6)

DRAWN BY :	PR	VERIFIED BY :	VC
DESIGNED BY:	VC	APPROVED BY :	AGN

SCALE:	DRG. NO.	DATE	REV.
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